UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

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FOREST INSECT SURVEYS
PORTLAND LABORATORY
1941 SEASON

GENERAL STATEMENT

During 1941 forest insect surveys were conducted by the Portland Forest Insect Laboratory in Oregon and Washington (Forest Service Region Six) and in the central Rocky Mountain Region, comprising portions of Forest Service Regions 2, 3, and 4. It is obvious that with this vast forest area requiring insect detection surveys and the limited funds and personnel at the disposal of this laboratory only a portion of the territory could be covered with Bureau personnel and the cooperative assistance of timber protective agencies had to be used to the fullest, wherever such help was available.

It has been recently estimated that loss from insects in the virgin forests of the Pacific Northwest has averaged $4,672,000 annually for the past 10 years. Of this loss about $3,000,000 has occurred in the pine forests of eastern Oregon and Washington. In the central and southern Rocky Mountains beetles have killed timber of an estimated value of $603,000 annually.

This tremendous waste of the National timber resource calls for study to determine what can be done to prevent and reduce this loss, and surveys to detect areas threatened with epidemics so that prompt control measures may be taken. Annual surveys are particularly needed in valuable commercial pine stands threatened with insect damage, and in parks and recreational areas where trees have a special value and importance.

Because this insect detection program is of great importance to the forest agencies charged with protecting timber properties, they have closely cooperated with the Bureau in carrying out the field surveys. The Bureau has acted as the central agency directing and coordinating the survey work and has assisted in training survey personnel of these other agencies, such as the Forest Service, Indian Service, and National Park Service.

The two large regions included in the survey program will be discussed separately.

FOREST INSECT SURVEYS IN OREGON AND WASHINGTON--REGION 6

Timbered areas of Oregon and Washington, comprising Forest Service Region Six, are divided into two distinct forest regions, (1) the Douglas fir region west of the Cascade Range and (2) the ponderosa pine region east of this central mountain range. The forest insect problems of the two forest regions are distinctly different.

So far nearly all of the forest insect survey work has been undertaken in the ponderosa pine region to determine the epidemic activity of the western pine beetle in ponderosa pine and the mountain pine beetle in lodgepole, sugar pine, and white pine. In the Douglas fir region some survey work has been done in Mount Rainier National Park to check activities of the mountain pine beetle in white pine stands. A survey is needed in the remainder of the Douglas fir region to determine how much damage insects are doing and whether or not control programs are warranted.

The importance of insect detection surveys in the pine region is illustrated by the fact that 98 billion board feet of pine valued at $312,000,000 is found in this region. All of this valuable resource is subject to attack by bark beetles and in the past 10 years these insects have brought about losses of pine averaging $2,470,000 a year. Of this approximately $1,535,000 was abnormal loss, a large part of which might have been prevented through control work. Surveys are the first step in planning an effective program of control and the values at stake fully justify the expenditures which have been made for this work.

Since 1937 the annual regional pine beetle survey has been carried out as a cooperative undertaking between the Forest Service, Indian Service, and Bureau of Entomology and Plant Quarantine. Additional cooperative survey work has been done by the Bureau with the Park Service in the two National Parks within this region; i.e., Crater Lake National Park and Mount Rainier National Park. As far as practicable, the work has been divided between these different agencies on the basis of the Forest Service covering National Forest lands, the Indian Service surveying Indian Reservations, the Park Service checking conditions on National Parks, and the Bureau of Entomology and Plant Quarantine surveying insect conditions on private lands, public domain, State lands, and other miscellaneous classes of ownership. It has not always been practical to divide the work strictly along these lines and considerable give and take has been necessary for the sake of greater efficiency. Throughout this period, the Bureau has outlined the survey methods to be used, has supervised the training of survey personnel, and has assisted in the actual surveying of all areas.

For the past several years, through the combined effort of all cooperating agencies, it has been possible to cover with insect detection surveys all of the commercial ponderosa pine type within eastern Oregon and Washington. To a certain extent the coverage has not been so intensive as might have been desirable but in no case were serious infestations overlooked, and control programs were initiated wherever they were needed and could be financed by the forest protection agency involved.

The 1941 Pine Beetle Survey in Region 6

Because of limitation in funds and the difficulty of obtaining survey personnel during the fire season, the 1941 survey was handled somewhat differently than in previous years.

The Bureau's CCC funds were reduced in amount and limited to the first quarter of fiscal year 1942. Accordingly two survey crews were organized in July and under the direct supervision of J. M. Whiteside and W. J. Buckhorn plot surveys were carried out on all of the areas usually covered by Bureau crews.

The Forest Service postponed their portion of the survey until later in the season when fire personnel could be recruited to make up the survey crews. Consequently their portion of the survey was not completed until late in November.

The Indian Service lacked trained survey personnel and since the CCC program had been curtailed they found difficulty in planning and conducting their portion of the survey program alone. Consequently the Bureau came to their assistance and helped survey the sample plots on the five reservations in the ponderosa pine region.

Because of these various difficulties the 1941 survey program has not been as satisfactory as the past programs for the following reasons:

(1) The training of personnel has not been uniform and hence results are not on as sound a basis as in previous years.

(2) The survey has extended over a long period of time (from late in July to the end of November) so that results from various plots are not comparable except by use of an estimating factor.

(3) The final results of the survey will not be available until too late to start fall control work, should such control work be indicated.

Survey Statistics

	Acres Surveyed	
	Total Acres*	Intensive Plots
Private Lands	3,950,000	3,840
Federal		
Indian Service	1,950,000	22,080
Forest Service	4,390,000	44,800
Public Domain	210,000	320
Other**	80,000	
State, County, Municipal	420,000	320
Total	11,000,000	71,360

Percent of area intensively surveyed = 0.65
Number of reports to be written = 19
Number of control projects = 1 (Warm Springs Indian Reservation)
Total acreage controlled = About 2,000 acres

*Total acres equals that acreage of ponderosa pine and sugar pine 12 inches or more DBH.

**Other Federal lands include lands classed as: Revested O and C Land Grant Lands, Railroad Selection Pending Lands, and lands reserved from cutting.

Division of the 1941 Survey Program

Surveyed by	Check Plot Acreage	% of Total
BE&PQ	22,400	31
Forest Service	29,120	41
Indian Service and BE&PQ	19,840	28
Total	71,360	100

Cost of the 1941 Survey

	Approximate Cost
Field Work (July 28 to December 1, 1941)	
BE&PQ (CCC and Regular Funds)	$2,700
Forest Service (Regular Funds)	3,500
Indian Service (CCC Funds)	1,000
Total	$7,200
Office Work	
BE&PQ	$2,000
Indian Service	350
Total	$2,350
Estimated total cost of survey	$9,550

ROCKY MOUNTAIN SURVEYS--REGIONS 2, 3, AND 4

With the closure of the Fort Collins laboratory, survey and service work in the forests of the central and southern Rocky Mountains was assumed by the Portland laboratory. Obviously this change necessitated a drastic reduction in the degree of coverage. Fortunately this reduced program came when the Black Hills beetle epidemic in Region 2 had largely subsided. In Region 3 no serious insect outbreaks have occurred recently. Outbreaks in Region 4, while intense locally, have been largely centered on two National Forests, the Wasatch and Powell.

National Forest Region 2

General situation. Bark beetles have been the principal insects causing damage to forests in Region 2. Of the several species involved, the Black Hills beetle has been by far the most important. For several years during the height of the recent epidemic this beetle took an annual toll of approximately 85,000,000 board feet of pine timber. Control operations against this epidemic reached a peak in 1938 when 54,000 infested pines were treated. Since then the outbreak has steadily decreased to a status of negligible importance at the present time.

Concurrently with the outbreak in pine, the Douglas fir beetle was very destructive to Douglas fir stands, particularly those in Wyoming. Extensive killing continued through 1940 and may still be in progress. Comprehensive figures on losses are not available, but an estimate of 500,000 trees killed on the Washakie National Forest in 1939 is indicative of the seriousness of the outbreak. Control was not attempted, except on the Cody Canyon recreational area of the Shoshone National Forest and on a small unit on the San Juan National Forest.

On National Forests in Region 2 the detection and suppression phases of bark beetle control have been largely the responsibility of the local forest officers. Upon request from the Forest Service, members of the Bureau of Entomology and Plant Quarantine have conducted "redtop" surveys and with these as a basis have advised as to the desirability of strip surveys or control. Under this arrangement only those areas apparently in need of control have been surveyed. An additional function of the Bureau has been to render technical assistance on control operations. A similar cooperative program was adopted with regard to National Park, State Park, and private lands, except that in these cases the responsibility for detection was largely delegated to the Bureau.

This method of conducting surveys was fairly satisfactory while technical personnel was available at Ft. Collins and during the height of the Black Hills beetle outbreak when most of the pine forests were infested and obviously needed attention. During this period the forest personnel became "bug conscious" and, through experience, qualified to report on outbreaks. As a continuing program without technical supervision this dependence upon diversified and constantly changing personnel has decided drawbacks. During periods of low infestation the tendency is toward overlooking significant developments or waiting until conditions are serious enough to "make it pay to treat". Such a policy can lead only to the large outbreaks that are so costly to control.

A much more desirable program would be to maintain at least one man whose job it would be to make an annual regionwide check of the forest insect situation. In this way annual estimates of losses could be made and would be available as a means of measuring changes of infestation. Since several land managements are involved, a representative of the Bureau of Entomology and Plant Quarantine could best handle this work.

1941 surveys. No bark beetle surveys were made by the Bureau of Entomology and Plant Quarantine this year, but Dr. N. D. Wygant spent several days checking on the Pandora moth situation at Newcastle, Wyo., and on the Arapaho National Forest. In July Mr. J. W. Spencer, who is now in charge of Timber Management in Denver, stated that all necessary bark beetle surveys would be undertaken by the Forest Service. At that time he did not know of any area requiring particular attention. No reports have been received from the Forest Service concerning survey findings.

1941 control. Concerning control for the 1941-42 season, it is known only that the Forest Service is contemplating a limited amount of cleanup on the Medicine Bow, Pike, and Roosevelt National Forests. During the fall of 1940 small maintenance control projects were proposed for the following areas: Black Hills, Cochetopa, Medicine Bow, Pike, Roosevelt, and San Juan National Forests, and Rocky Mountain National Park. It is assumed that these projects were completed during the spring of 1941. The combined acreage suggested for treatment probably did not exceed 40,000 acres of National Forest land and 5,000 acres of National Park land.

National Forest Region 3

General situation. During recent years few bark beetle outbreaks have occurred in the Southwest. Such outbreaks as have occurred have been kept well in hand by the Forest Service and the National Park Service. From time to time, while the Fort Collins laboratory was in existence, general examinations were made by the personnal and advice on control matters was given the land managing agencies. This policy has since been continued in so far as possible.

1941 surveys and control. No formal surveys were made in 1941 by members of the Bureau of Entomology and Plant Quarantine. During late August N. D. Wygant of the Berkeley laboratory made a trip of examination to determine the status of tent caterpillar infestation of aspen on the Carson and Santa Fe National Forests. A report was prepared covering the findings. No information is available as to any bark beetle surveys or control that may have been carried on this season by the land managing agencies.

National Forest Region 4

General situation. The Black Hills beetle in the forests of Region 4, as in Region 2, has caused the greatest damage. In southern Utah an outbreak that killed much ponderosa pine on the Powell National Forest and in Bryce Canyon National Park has finally yielded to control efforts and infestation is now reduced practically to normal. On the Wasatch National Forest and more recently on the Ashley National Forest the Black Hills beetle (or the mountain pine beetle if there is a distinction between the two in this area) has killed and is continuing to kill much lodgepole pine, although control work is beginning to effect a substantial reduction. The Douglas fir beetle is causing widespread damage, particularly in the forests of southern Utah. No efforts are being made to control this insect. Elsewhere in the region other bark beetles are causing relatively minor damage that is of importance chiefly in recreational areas such as the Charleston Mountain unit of the Nevada National Forest.

Detection surveys and control in Region 4 have been handled in much the same way as in Region 2. During the last two years cooperative efforts of the Bureau have been largely shifted from the forests of Colorado and Wyoming to those of Utah because of greater need in the latter state. Lack of sufficient operating funds has allowed very little participation in the actual survey work. Therefore, the main effort has been directed toward instruction of survey crews, interpretation of survey data, and assistance with the technical aspects of control projects.

A man is needed to take charge of and be responsible for all the survey work in the same manner as has been proposed for Region 2.

1941 surveys. No formal surveys were undertaken this season by the Bureau. General examinations were made of parts of the Ashley, Dixie, Powell, and Wasatch National Forests and six reports were prepared covering the findings. The following surveys were conducted by the Forest Service:

Area	Approximate Acreage	Type of Survey
Ashley National Forest	10,000	Strip
Dixie National Forest	10,000	Redtop
Powell National Forest	75,000	Strip
Wasatch National Forest	131,000	Strip
Total	226,000	

As the surveys in northern Utah have been extended, more and more infested units have been discovered. Therefore, there is an immediate need for a comprehensive survey of all the lodgepole pine stands of the Ashley, Uinta, and Wasatch in order to determine the exact status of the outbreak.

1941 control. Control for the 1941-42 season is planned for or is already in progress on the following areas:

Area	Approximate Number of Trees to be Treated
Ashley National Forest	5,700
Dixie National Forest	400±
Powell National Forest	1,000
Wasatch National Forest	18,000
Total	25,100
Bryce Canyon National Park	Maintenance control(?)

The Ashley and Wasatch projects are in reality directed against a single outbreak. Because of inadequate funds, a substantial portion of the infestation on the Wasatch cannot be treated. Coverage of the proposed units on the Dixie and Powell should give adequate control on these forests.

SURVEY FUNDS

With the reduction of appropriations in 1940 which necessitated the closing of the Fort Collins laboratory and with the cut in CCC funds in 1941, insect surveys have had to be curtailed in all regions to the point where adequate coverage is impossible. The very minimum funds necessary to meet the requirements of this survey program are as follows:

	Funds Available F. Y. 1942	Minimum Requirements for Satisfactory Work
Oregon and Washington— Region 6	$4,700	$10,000*
Rocky Mountain Regions	600	5,000**

*Increase needed to make up for loss of CCC funds.

**Funds needed to provide one man for full time work in these regions.

A more adequate program should provide for one man full time in each of Regions 2 and 4.